

EASY INSTRUCTIONS
FOR OPERATING THE

CONTROLLED-KEY

COMPTOMETER

REG. U. S. PAT. OFF.

COMPTOMETER DIVISION

FELT AND TARRANT MFG. CO.

1735 NORTH PAULINA ST.

CHICAGO 22, ILLINOIS

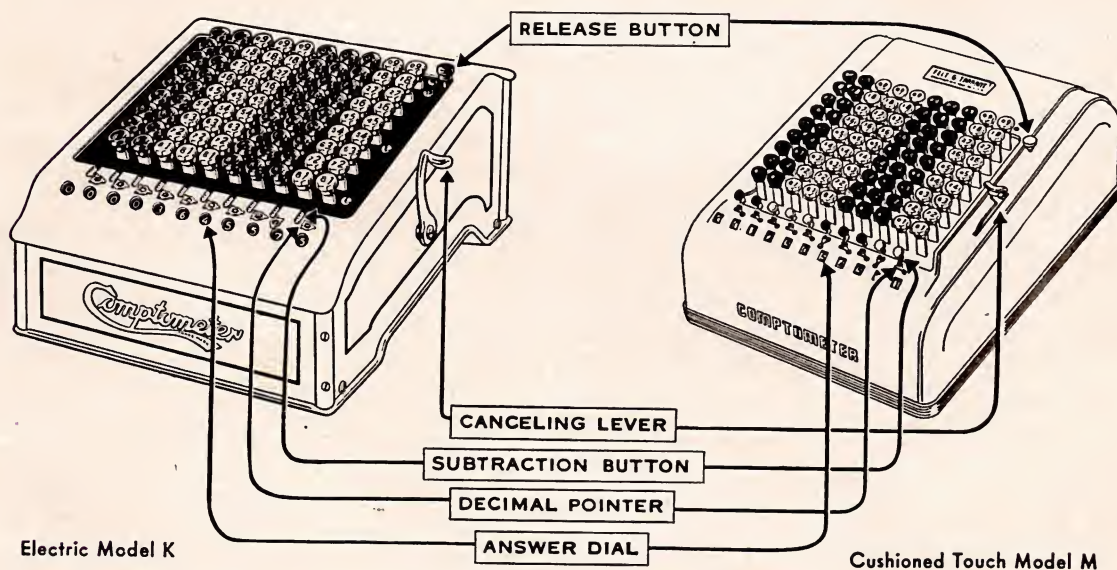
DECIMAL EQUIVALENTS OF COMMON FRACTIONS

4THS		6THS		8THS		12THS		16THS	
1	.25	1	.1667	1	.125	1	.0833	1	.0625
2	.5	2	.3333	2	.25	2	.1667	2	.125
3	.75	3	.5	3	.375	3	.25	3	.1875
		4	.6667	4	.5	4	.3333	4	.25
		5	.8333	5	.625	5	.4167	5	.3125
				6	.75	6	.5	6	.375
				7	.875	7	.5833	7	.4375
						8	.6667	8	.5
						9	.75	9	.5625
64THS						10	.8333	10	.625
1	.0156	22	.3438	43	.6719	11	.9167	11	.6875
2	.0313	23	.3594	44	.6875			12	.75
3	.0469	24	.375	45	.7031			13	.8125
4	.0625	25	.3906	46	.7188			14	.875
5	.0781	26	.4063	47	.7344			15	.9375
6	.0938	27	.4219	48	.75	32NDS			
7	.1094	28	.4375	49	.7656	1	.03125	17	.53125
8	.125	29	.4531	50	.7813	2	.0625	18	.5625
9	.1406	30	.4688	51	.7969	3	.09375	19	.59375
10	.1563	31	.4844	52	.8125	4	.125	20	.625
11	.1719	32	.5	53	.8281	5	.15625	21	.65625
12	.1875	33	.5156	54	.8438	6	.1875	22	.6875
13	.2031	34	.5313	55	.8594	7	.21875	23	.71875
14	.2188	35	.5469	56	.875	8	.25	24	.75
15	.2344	36	.5625	57	.8906	9	.28125	25	.78125
16	.25	37	.5781	58	.9063	10	.3125	26	.8125
17	.2656	38	.5938	59	.9219	11	.34375	27	.84375
18	.2813	39	.6094	60	.9375	12	.375	28	.875
19	.2969	40	.625	61	.9531	13	.40625	29	.90625
20	.3125	41	.6406	62	.9688	14	.4375	30	.9375
21	.3281	42	.6563	63	.9844	15	.46875	31	.96875
						16	.5		

INTRODUCTION

THE COMPTOMETER is a key-driven adding and calculating machine which performs quickly and easily all forms of arithmetical figuring involving addition, multiplication, division, and subtraction.

each key top is a large and small figure. The large figures are used for addition and multiplication; the small figures for division and subtraction. The answer dials show the result of the calculation. The lever at the right, called the canceling lever, clears



Method of operation is the same for Models J, K, and M.

Operation is exceedingly simple—no operating lever to pull, no crank to turn, no preliminary setting of dials. Nothing to do but press the keys and read the answer—the machine does the rest.

The keyboard is arranged in eight or more columns* of nine keys each, which are grouped in alternating sections, colored green and white. On

the answer dials. The pointers above the answer dials are used to point off decimals. The cut-offs or buttons at the left of each column are used for subtraction. The red release key at the upper right-hand corner unlocks the keyboard after an incomplete key stroke error has been corrected. See page 5 for proper use of controlled-key.

*The Comptometer is manufactured in three standard sizes: 8, 10, and 12-columns. A 20-column Comptometer is also manufactured for use in heavy statistical and distribution work.

ADDITION

General Instructions

THE two columns of white keys on the right side of the keyboard are for adding units and tens of cents. The next three columns of green keys are for adding units, tens, and hundreds of dollars. The adjoining three columns of white keys are for adding thousands, tens of thousands, and hundreds of thousands, amounts. Keys farther to the left are for adding correspondingly higher denominations.

In addition always use the large figures on the keys.

Only one key should be operated at a time. For example, in adding \$3.45, first press down the 3 key in the third column, then the 4 key in the second column and then the 5 key in the first column. No keys are depressed for ciphers. Always lift the finger slightly off the key after each stroke. For the first few days go slowly, memorizing the keyboard and acquiring rhythm.

Remember to place the finger on the key desired and press it down until you feel it strike bottom. This push-stroke requires practice. It differs distinctly from the sharp staccato blow of the typewriter. It is the easiest known stroke on the finger. It eliminates the impact of striking the key.

Full Keyboard Method

Below are six columns of figures to be added. Use only the index and second finger. The index finger is to be used for all figures except the right-hand figure which should be added with the second finger.

Use the full keyboard, adding each item across from left to right. If you find the keyboard locked it is a positive signal of misoperation. The rule for correcting operating errors is explained on page 5. For the first few days go slowly. Speed will come later. Depress only one key at a time.

<u>No. 1</u>	<u>No. 2</u>	<u>No. 3</u>	<u>No. 4</u>	<u>No. 5</u>	<u>No. 6</u>
41.79	91.59	79.27	42.67	21.25	96.57
18.57	78.25	65.76	58.14	15.96	5.82
21.45	451.35	413.45	87.00	43.21	68.42
4.67	6.47	135.00	45.50	87.65	102.19
432.35	5.60	223.57	235.00	1.92	79.18
14.46	12.35	86.40	57.68	218.19	517.29
5.38	38.00	240.00	68.77	93.15	61.48
432.25	913.50	33.46	433.24	37.92	43.27
165.70	42.34	5.67	700.00	479.99	197.52
540.62	78.16	41.71	307.20	45.55	37.25

Add each column and write the total obtained. Then prove at once by re-adding the column. For practice add each column at least four times. If

an error is made it is usually the result of trying to go too fast.

TOUCH METHOD

TOUCH method of addition provides the greatest degree of speed and accuracy and is simple and easy to learn. Touch method is highly recommended, because it eliminates time spent in looking from the work to the keyboard. Only the lower half of the keyboard is used in touch addition; all keys are within easy reach of the fingers.

To add 6, strike 3 twice

To add 7, strike 3 and 4

To add 8, strike 4 twice

To add 9, strike 4 and 5

Upon examining the keys it will be noticed that the odd-numbered keys: 1, 3, 5, etc., are concave. The even keys: 2, 4, etc., are flat-topped. This is to facilitate touch operation.

With this in mind add the following examples.

Begin at the top of each column and add down. Use the first finger for adding in the tens column only and the second finger for adding the units column only. Keep each finger on its own column. Find the keys by sense of touch, as much as possible.

In adding it is necessary to acquire a smooth rhythmic stroke. Hold a pencil between the thumb and palm of the operating hand. This helps to balance the hand and the pencil is always in readiness for writing down answers.

A Comptometer improperly placed is detrimental to speed and ease of operation. It should be placed at right angles or slightly to the right of the operator with the left edge in a direct line with the center of the body. The desk and the seat of the chair should be of a height to permit the feet to touch the floor and the fingers to rest comfortably on the keys.

<u>No. 1</u>	<u>No. 2</u>	<u>No. 3</u>	<u>No. 4</u>	<u>No. 5</u>	<u>No. 6</u>	<u>No. 7</u>
22	33	43	23	67	84	25
23	34	33	26	43	47	92
33	43	12	43	77	63	14
34	32	54	48	65	84	52
44	31	23	35	95	93	71
45	35	32	49	48	32	42
55	53	24	43	64	26	35
54	25	25	36	23	82	92
43	24	35	42	72	48	25
<u>353</u>	<u>310</u>	<u>281</u>	<u>355</u>	<u>554</u>	<u>559</u>	<u>448</u>

Add each column and compare the total obtained with that shown at foot of column. For practice add

each column at least four times. Practice for a full rhythmic stroke. Speed will come with practice.

TOUCH METHOD

Adding Whole Numbers and Dollars and Cents

TO ADD the following three and four-figure items use the index finger for all figures except the extreme right-hand figure. The second finger is used only in adding the extreme right-hand figure.

With eyes on the work—no glancing back and

forth from keyboard to work sheet—it is apparent that the danger of misreading figures is greatly reduced. The superior adaptability of the Comptometer to touch operation gives it a positive advantage in speed-with-accuracy.

<u>No. 1</u>	<u>No. 2</u>	<u>No. 3</u>	<u>No. 4</u>	<u>No. 5</u>	<u>No. 6</u>	<u>No. 7</u>
212	367	378	24.36	54.56	33.45	70.00
364	238	265	42.67	43.21	65.34	543.21
543	762	532	43.24	32.61	77.21	29.00
267	926	461	62.42	11.33	43.12	98.23
845	545	637	17.56	32.24	63.33	378.80
963	823	572	24.36	82.27	63.44	345.45
787	415	726	21.11	72.56	14.55	896.87
312	564	847	32.35	23.24	54.33	454.22
357	382	623	46.54	72.27	25.98	30.00
386	637	549	22.66	44.45	65.67	27.42

Add each column and write the total obtained. Then prove at once by re-adding the column. For practice add each column four times in order to fix firmly in mind the combinations used.

"Split" Method of Addition

In adding long columns it is often an advantage to split the items, adding first the cents and then the dollars. Add columns number 4, 5, 6 and 7 using this method. First add cents only, adding the tens with the first finger and the units with the second finger, leaving the total of cents in the answer dials.

Then add the dollars, using the first finger for the tens and the second finger for the units. Correct selection of keys is made entirely by sense of touch. In adding column number 7 use the first finger for both hundreds and tens of dollars.

Add each column and write the total obtained. Then prove at once by re-adding the column. For practice add each column at least four times in order to fix firmly in mind the combinations used.

As previously mentioned under General Addition Instructions, a locked keyboard is a positive signal of misoperation. The rule for correcting misoperation is found on page 5.

CONTROLLED-KEY

THE "Controlled-Key" is a positive system of automatic control which prevents operating errors caused by fumbled or incomplete key strokes. The "Controlled-Key" mechanism gives instant signal of an operating error, by locking all columns except the column in which the incomplete key stroke was made—and this is left open for correction. With positive protection against operating errors, the operator can speed up safely and be assured of a higher degree of first time accuracy.



How to Correct an Incomplete Key Stroke

There is no guesswork required in using **Controlled-Key**, neither is there a complicated formula to follow.

In adding, when a locked keyboard signals an operating error, the use of **Controlled-Key** is as simple as going back to the last key operated. If this key is left open for correction, complete the stroke, touch the red release button and continue adding, starting on the key that locked and signaled the error as shown in the example.

Example:

In adding this short column, intentionally press the 5 cent key part way down. On attempting to strike the 2-key, you find it locked. Go back and depress again the last key operated (5), touch the red release button and the correction is made. Continue adding on the key that locked and signaled the error, 2.

In adding, when a locked keyboard signals an operating error and the last key operated is found locked, touch the red release button, add in the previous key in same column, and continue adding

with the key that locked and signaled the error as shown in the example.

Example:

In adding this column, intentionally press the 30-key part way down. Then give the 40-key a regular stroke. On attempting to strike the 5-key, you find it locked. To correct, go back to the last key depressed (40), and you will find it locked. Touch the red release button and add in the previous key (30). This completes the correction. Continue adding, beginning on the key that locked and signaled the error, 5.

In Multiplication and Division

When the key locks, the positive danger signal prevents an error slipping into an answer without the knowledge of the operator.

Owing to the speed of the Comptometer, it is simpler, and faster to cancel and go over the problem than to stop and make the correction.

MULTIPLICATION

Example: Multiply 1364 x 57

PLACE the first finger of the left hand on the 50 key and the first finger of the right hand on the 7 key. Strike the 57 in this position as many times as the right-hand figure (4) of the multiplicand indicates. Move both fingers one column to the left and strike as many times as indicated by the second figure (6) of the multiplicand. Continue to move to the left, striking in each column the multiplier as many times as indicated by the successive figures (3—1) of the multiplicand.

In beginning multiplication confine yourself to the use of the first finger of the right hand and the first finger of the left hand.

After the fingers have been positioned on the keys representing the multiplier, strike slowly, giving each key a full push-stroke, until you feel it strike bottom. Raise the fingers slightly above the keys after each stroke. Speed will develop quickly.

After placing the fingers on the proper keys, look at the example, rather than the keyboard, so that the figures will not be misread.

In each of the following examples use the first finger of the left hand for the tens figure of the multiplier and the first finger of the right hand for the unit figure:

<u>No. 1</u> 24,531 35	<u>No. 2</u> 12,456 68	<u>No. 3</u> 5,315 64	<u>No. 4</u> 23,456 75	<u>No. 5</u> 84,143 79
<u>No. 6</u> 35,642 45	<u>No. 7</u> 15,341 88	<u>No. 8</u> 45,673 28	<u>No. 9</u> 36,341 23	<u>No. 10</u> 14,683 47
<u>No. 11</u> 89,986 37	<u>No. 12</u> 15,366 15	<u>No. 13</u> 65,418 31	<u>No. 14</u> 94,345 63	<u>No. 15</u> 14,312 86
<u>No. 16</u> 26,433 19	<u>No. 17</u> 46,541 91	<u>No. 18</u> 63,222 83	<u>No. 19</u> 46,812 61	<u>No. 20</u> 46,533 11

Example: Multiply 314 x 45

Place the first and second fingers of the right hand on the keys in the right-hand columns representing the multiplier (45), and strike as many times as indicated by the right-hand figure (4) of the multiplicand; move the fingers one column to the left and strike as many times as the second figure (1) of the multiplicand indicates. Continue to move to the left, striking as many times as the succeeding figure (3) of the multiplicand indicates.

The first and second fingers of both hands are more commonly used than any of the other fingers. A safe rule to follow is to use the longest finger for the highest number.

Multiply each of the following problems, using the fingers as shown by the abbreviations in front of, and following the multiplier. 1L and 2L indicate first and second fingers of the left hand. 1R and 2R indicate first and second fingers of the right hand.

Raise the fingers slightly above the keys after each stroke.

<u>No. 1</u> 43 1R <u>34</u> 2R	<u>No. 2</u> 13 2R <u>42</u> 1R	<u>No. 3</u> 47 1L <u>62</u> 1R	<u>No. 4</u> 83 1L <u>37</u> 1R	<u>No. 5</u> 276 1L <u>345</u> 1 & 2R
<u>No. 6</u> 19 2R <u>54</u> 1R	<u>No. 7</u> 342 1L <u>153</u> 2 & 1R	<u>No. 8</u> 43 1L <u>39</u> 1R	<u>No. 9</u> 43 1L <u>13</u> 1R	<u>No. 10</u> 56 <u>89</u> 1 & 2R
<u>No. 11</u> 75 1R <u>46</u> 2R	<u>No. 12</u> 83 1L <u>87</u> 1R	<u>No. 13</u> 28 1L <u>19</u> 1R	<u>No. 14</u> 284 1L <u>324</u> 1 & 2R	<u>No. 15</u> 104 1L <u>678</u> 1 & 2R

For practice purposes it may be convenient to split the multiplier when it contains four figures. Example: Multiply 12,365 x 8,379. First multiply 12,365 by 79, leaving the result in the machine. Then multiply 12,365 by 83, starting the 83 in the fourth and third columns.

NOTE: A hyphen indicates where the multiplier should be split. When multiplying with two figures, the first finger of each hand is usually used. Point off as many places from the right as there are decimals in both factors.

<u>No. 16</u> 67.44 1L <u>735</u> 1 & 2R	<u>No. 17</u> 245.6 <u>65-35</u>	<u>No. 18</u> 5613 <u>27-18</u>	<u>No. 19</u> 584.26 <u>53-78</u>	<u>No. 20</u> 5362 1L <u>.523</u> 1 & 2R
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No. 211746543-45No. 22150821L 31.04 1 & 2RNo. 231346119-19No. 241372373-65No. 25191.4792-23No. 26481737-29No. 27.54471L 625 1 & 2RNo. 28671473-68No. 29367294-45No. 30574.416-17

Large Decimal Multiplications

IN MULTIPLYING large numbers containing decimals, it is advisable to strike from the left toward the right. Hold the multiplier with its left-hand figure on the left-hand column of the machine. Strike here as many times as is shown by the left-hand figure of your multiplicand, and then move one column to the right, etc. Point off as many answer dials from the left as the sum of the whole places in the multiplicand and multiplier.

Example: Multiply 12.345 x 4.356

Hold 4356 with the 4 on the left-hand column of

the machine and in this position strike once. Move each finger one column to the right and strike two times; one more column to the right and strike three times—then four times, then five times. The result as it stands in the answer dials is 053774820. (An eight column Comptometer was used in figuring this problem.) There are two whole places in 12.345 and one in 4.356, making together three answer dials to point off from the left of the machine, and the answer is 53.77482.

NOTE: Hyphen in multiplier indicates where it may be split.

Examples:

No. 1346.211L 4.67 1 & 2RNo. 214.3742 & 1L 32.78 1 & 2RNo. 32.26359.4-56No. 4.3562491.-47No. 511.4631L 37.8 1 & 2RNo. 64627.11L .846 1 & 2RNo. 726.5162 & 1L 21.68 1 & 2RNo. 8314.627.3-49No. 9243.822 & 1L 53.33 1 & 2RNo. 10986.42 & 1L 31.32 2 & 1RNo. 11328.6416.-17No. 12304.692 & 1L 216.7 1 & 2R

Three-Factor Multiplication

WHEN three numbers are to be multiplied such as, 57 bolts of 12 yards each at \$1.25 per yard, proceed as follows: Multiply 57 x 12 on the right of the machine. Leave the result 684 in the answer dials. Since 684 is registered in the machine once it is necessary to multiply it only 124 times more. Therefore, hold 124 with the 4 over the

left-hand figure (6) of the 684. Strike the number of times indicated, six; move to the right one column and strike the number of times indicated, eight. Move one more column to the right and strike four times. The answer is \$855.00. In moving from left to right, the figure in the answer dial under the 4 key shows the number of times 124 should be struck.

Examples:

No. 1
345 x 289 x .56

No. 2
789 x 88 x 5.46

No. 3
6452 x 344 x .66

No. 4
33 x 875 x 4.58

No. 5
645 x 4456 x .28

No. 6
389 x 673 x 438

No. 7
75 x 6489 x 567

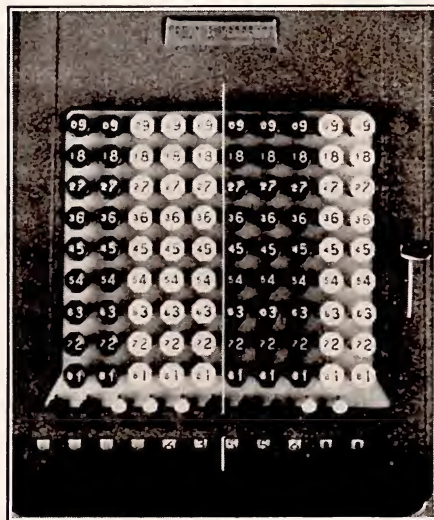
No. 8
372 x 44 x 8879

NOTE: Point off as many places from the right as the sum of the decimals in the three factors.

Permanent Decimal Point Multiplication

WHEN factors contain changing decimals it will be easier and faster for the operator to use a method of working the multiplications over a fixed or Permanent Decimal Point. Between the fifth and sixth column of keys, directly over Decimal Pointer No. 5, is the position known as the Permanent Decimal Point. See illustration.

Usually the price factor is held on the keyboard—dollars to the left of the Permanent Decimal Point, and cents to the right of the Permanent Decimal Point. With the price factor in this position strike it in as many times as the unit figure of the quantity indicates.



Permanent Decimal Point—this is located between the fifth and sixth column of keys, directly over Decimal Pointer No. 5.

Move price factor one column to the left for each additional whole number in the quantity, and one column to the right for each column of decimals in the quantity.

Example:

345 lbs. @ \$.65 per lb.

Answer \$224.25

Hold price factor \$.65 so that the 6 key is held in the fifth column and the 5 key in the fourth column. Strike the price factor five times for the unit figure of quantity. Move price factor one column to the left and strike it four times for the TENS figure of quantity. Move price factor again one column to the left

and strike it three times for the HUNDREDS figures of the quantity—\$224.25 now appears in the answer dials correctly pointed off.

Work the following problems over the Permanent Decimal Point, following the explanation in the previous paragraph.

Examples:

- | | | | | |
|----|-----------|------------------|---|----------|
| 1. | 307 hrs. | @ \$.45 per hr. | = | \$138.15 |
| 2. | 65 doz. | @ .22 per doz. | = | 14.30 |
| 3. | 45 tons | @ 7.75 per ton | = | 348.75 |
| 4. | 15 days | @ 4.50 per day | = | 67.50 |
| 5. | 241 bolts | @ .67 each | = | 161.47 |

Accumulative Multiplication Using Permanent Decimal

A RAPID and accurate method of checking and proving original multiplications is by accumulation. This method is very effective in proving payrolls, cost sheets, material requisitions, inventory sheets, invoices, etc.; in fact it should be used wherever it is desired to total the products of several multiplications. To obtain the best results from accumulative multiplication, it should be performed over the fixed or Permanent Decimal Point. This Permanent Decimal Point is between the fifth and sixth columns, or as previously explained, directly over Decimal Pointer No. 5.

It is easy to remember that the sixth (white) column of keys is UNITS of DOLLARS; the fifth column is TENS of CENTS and the fourth column is UNITS of CENTS.

Example:

4¾	(4.75) yards @	\$1.25
16½	(16.5) yards @	.34½
148¼	(148.25) yards @	.06¼
Accumulated Product		\$20.90

Hold the price \$1.25 with the 1 in the sixth (white) column, the 2 in the fifth and the 5 in the fourth column. Multiply toward the right; strike four times, seven times, and five times. The answer dials show \$5.9375. LEAVE THIS IN THE MACHINE.

Multiply the second item in a similar manner holding .345 with the 3 in the fifth, 4 in the fourth, and 5 in the third columns, respectively. As the yardage commences in the TENS COLUMN, move the price position one column to the left before commencing

the multiplication. Strike from left to right one, six, and five times, respectively, and the accumulation in answer dials now shows \$11.63. LEAVE THIS IN THE MACHINE.

For the third item hold .0625 with the 6 in the fourth column. As the yardage commences in the HUNDREDS COLUMN, move the price position two columns to the left before starting the multiplication. Strike in the keys one, four, eight, two, and five times in their respective columns. The accumulated answer of \$20.895 now appears in answer dials. If at any time fingers drop off the keyboard on THE RIGHT-HAND SIDE, continue to strike with fingers that still remain on keyboard.

By the use of this method positive proof is obtained on:

- (a) Each individual extension
- (b) Decimal point in the final result
- (c) Addition of items

Always take the **price position** on keyboard as previously explained—if the quantity has more than one whole number move the price position (before multiplying) one column to the left on the keyboard for each additional whole number in the quantity. For instance, move one column to the left for $48\frac{3}{4}$, two columns for $236\frac{3}{4}$, etc.

Example No. 1

$1\frac{1}{8}$	(1.125)	yards	@ \$.48
$12\frac{1}{4}$	(12.25)	yards	@ .64 $\frac{3}{4}$
67		yards	@ .50
$6\frac{3}{8}$	(6.375)	yards	@ 1.23
Accumulated Total			<u>\$49.81</u>

Example No. 2

$16\frac{2}{3}$	(16.667)	yards	@ \$.34 $\frac{1}{2}$
172		yards	@ .06 $\frac{1}{2}$
$25\frac{1}{4}$	(25.25)	yards	@ 1.89
256		yards	@ .19
Accumulated Total			<u>\$113.29</u>

FIRST-TIME ACCURACY

ONLY when machine figuring becomes entirely automatic and the human element of error in operation ceases to be a factor, can there be dependable first-time accuracy in mechanical calculation.

This is evidenced by the fact that accounting offices in which first-time results are accepted without being checked or refigured, are so few as to be negligible. When working against a predetermined

total such proof is, of course, unnecessary.

First-time machine figuring, however, should closely approximate absolute accuracy on all classes of figure work.

With the Comptometer it does that.

In figuring a recent inventory of a chain of 100 grocery stores, the first-time accuracy of the Comptometer was 99.551%.

Subtraction

Subtraction is the process of finding the difference between two numbers. This is performed on the Comptometer by using the small figures on the key-tops and the subtraction "cut-off" or button.

NOTE: When using the Model M Comptometer do not hold the subtraction button after setting it for a subtraction. It returns to normal when the carry has been foiled.

Example: $98 - 75 = 23.$

Put 98 in the right of keyboard. Hold back "cut-off" or button (see note) at the left of the figure 9; depress a small 7 in the second column and a small 4 (5 less 1) in the first column — answer 23. To prove, add 75 to 23 in machine. Answer 98 agrees with amount started with.

Example: $845 - 702 = 143.$

Put 845 in the right of keyboard. Hold back "cut-off" or button (see note) at the left of the figure 8; depress a small 7 in the third column, a small cipher in the second column, and a small 1 (2 less 1) in the first column — answer 143. To prove, add 702 to 143 in machine. Answer 845 agrees with amount started with.

Example: $\$28.64 - \$9.62 = \$19.02$

Put 28.64 in right of keyboard. Hold back "cut-off" or button (see note) at left of figure 2. Borrow from fourth column by depressing cipher key; as there are no small 9 figures, ignore the 9 in the third column, depress small 6 in the second column and a small 1 (2 less 1) in the first column — answer \$19.02. To prove, add \$9.62 to \$19.02 in machine. Answer \$28.64 agrees with amount started with.

The processes to follow in subtraction:

1. Put larger amount in the Comptometer.
2. Hold back "cut-off" or button at the left of an amount in the register equal to or larger than the amount to be subtracted.
3. Holding back the "cut-off" or button depress the amount to be subtracted in small figures, less one.
4. If necessary to borrow, hold back the "cut-off" or button at the left of the column or columns from which you borrow. Depress the small cipher key in such column or columns.

Cipher keys are used in the amount to be subtracted if they come between figures of value, but are ignored if at the end of a number. The 9's are ignored unless they come at the end of a number when one less than nine (8) is depressed.

The apostrophe in the following problems indicates where the "cut-off" or button is to be held back.

1. '4.36 Add large figures
1.25 Small figures 124

3.11
3. '21.43 Add large figures
6.42 Small figures 0641

15.01
5. '65.23 Add large figures
31.00 Small figures 30**

34.23
7. '15.60 Add large figures
8.83 Small figures 0882

6.77

2. '8.34 Add large figures
.68 Small figures 067

7.66
4. 1'70.36 Add large figures
.85 Small figures 0084

169.51
6. '6.42 Add large figures
1.93 Small figures 1*2

4.49
8. '48.50 Add large figures
9.60 Small figures 0*5*

38.90

Use of Small Figures in Subtraction or Division

NOTE 1. In subtracting or dividing, use the keys with the corresponding small figures, except for the right-hand figure of value, for which one less must be used.

	Right-Hand Figure of Value			
	↓	↓	↓	↓
To subtract or divide with	462	127	3600	4620
Use small figures	461	126	35	461

NOTE 2. The small cipher keys should be depressed the same as any other figure when they appear between figures of value, as in 704, but should be disregarded if they are at the right of the amount, as in 7500.

To subtract or divide with	704
Use small figures	703
To subtract or divide with	7500
Use small figures	74
To subtract or divide with	46005
Use small figures	46004

To subtract or divide with 63500
Use small figures 634

NOTE 3. If the right-hand figure of value in the amount is a 1, then one less is 0, and this small cipher should be struck.

To subtract or divide with 3241
Use small figures 3240
To subtract or divide with 3100
Use small figures 30

NOTE 4. As there are no small 9 keys, pass any column which contains 9; except where 9 is the right-hand figure of value, then the small 8 is used.

To subtract or divide with 8947
Use small figures 8 46
To subtract or divide with 1695
Use small figures 16 4
To subtract or divide with 983
Use small figures 82
To subtract or divide with 379
Use small figures 378

*Used to designate columns in which no keys are depressed.

DIVISION

DIVISION is the process of finding the number of times one number is contained in another.

Although division is not used as frequently in the average office as addition and multiplication, it is, however, very important and used extensively in statistics of all kinds.

The machine method of division is more simple on the Comptometer than the mental or written process for it consists merely of a series of subtractions and the quotient, or answer figure, is a record of the number of subtractions made.

Division on the Comptometer is as simple as any other operation. The underlying principle of division is explained in the following example:

Example: $1477.63 \div 133$

Place 147763 (the dividend) into the left side of the Comptometer using large figures.

Pull down the decimal pointer on the machine in the same position as it appears in the written dividend. (1477|63). The divisor (133) contains three

DIVIDEND DECIMAL

whole numbers; that is, it has three figures to the left of its decimal point. Move your finger to the left of the dividend decimal position three places. Pull down the pointer in this position. You have now established the decimal point for your answer. (1|47763).

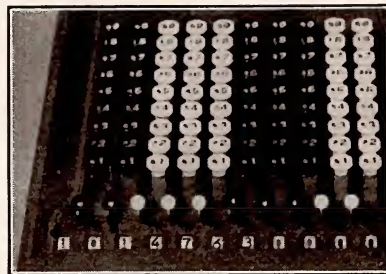
ANSWER DECIMAL



Hold 133 (the divisor) using small figures less one (132) directly over 147. Depress these divisor keys until the amount in the register dials at the base of the columns in which you are holding the divisor is less than 133.

In this example, the remainder is 014, which is less than your divisor, 133.

Move your divisor position, held on the keyboard, one place to the right. You are now holding your divisor over 147 in the register dials.



Remainder is 014.

Depress 132 (divisor figures). Remainder is 014 which is less than your divisor 133.

Move your divisor position, held on keyboard, one place to the right. You are now holding your divisor over 146 in the register dials.

Depress 132 (divisor figures). The remainder is 013 which is less than your divisor, 133.

Move your divisor position, held on keyboard, one place to the right. You are now holding your divisor over 133 in the register dials.

Depress 132 (divisor figures). The remainder is 000.

Copy your answer — 11.11.

Example: $8153.40 \div 254$

Place 815340 (the dividend) into the left side of the Comptometer using large-numbered keys.

Locate your dividend decimal position: 8153|40.

DIVIDEND DECIMAL

Establish your answer decimal point position: 8|15340.

ANSWER DECIMAL

Hold your divisor 254 (using small-figured keys 253) over 815 in the register dials.

Depress 253 (divisor figures) until the remainder in the register dials is less than the divisor, 254. Remainder is 053.

Move your divisor position, held on keyboard, one place to the right over 533 in the register dials.

Repeat depressing and moving until the entire problem is completed.

Answer: 32.10.

Practice Division Problems

$$\begin{array}{r} 4775.38 \div 226 = 21.13 \\ 2326.59 \div 189 = 12.31 \\ 6265.45 \div 145 = 43.21 \\ 95061.75 \div 175 = 543.21 \\ 978879.74 \div 487 = 2010.02 \end{array}$$

When we have a problem in division such as:

$$194.25 \div 875$$

Put 19425 (the dividend) into the Comptometer.

Establish dividend decimal point.

Point off three places to the left of the dividend decimal position to establish the answer decimal position.

Hold 875 (divisor figures), using small figures 874, over 194. 194 is less than divisor 875.

Move your divisor position, held on keyboard, one place to the right. You are now holding your divisor over 1942 in the register dials.

This is the only difference in the operation of division you have learned so far.

Depress 874 (divisor figures) as many times as shown by the figure in the register dial at the left of the columns in which you are holding the divisor.

The figure 1 appears to the left of these columns.

Depress 874 (divisor figures) one time. The figure 1 changed to 2.

Depress 874 one more time to equal the figure 2. 192 (remainder figure) is less than 875.

Move your divisor position, held on keyboard, one place to the right.

The number in the register dial at the left of the columns in which you are holding the divisor is 1.

Depress 874 (divisor figures) one time. The figure 1 changed to 2.

Depress 874 (divisor figures) one more time to equal the figure 2. 175 (remainder figure) is less than 875.

Move your divisor position, held on keyboard, one place to the right.



Hold the Divisor over 1942 in the Register Dials.

The number in the register dial at the left of the columns in which you are holding the divisor is 1.

Depress 874 (divisor figures) one time.

The number 1 in the register dial at the left of the columns in which you are holding the divisor did not change.

The remainder is 875. Depress 874 (divisor figures) one time.

Answer is .222.

For all practical purposes it is unnecessary to carry division beyond the fourth figure to the right of the decimal point.

POINTING OFF IN DIVISION

Pointing off on the Comptometer in division is very simple and accurate. Turn down the decimal pointer in the register to agree with the decimal point in the dividend. To establish the ANSWER DECIMAL POINT turn down the pointer as many places to the left of the dividend decimal point as there are figures to the left of the decimal point in the divisor. **See Illustration.**

Example: $134.5 \div 25 = 5.38$

Put the dividend 134.5 into the left side of keyboard. Pull down the decimal pointer between the 4 and 5 to correspond to the decimal point appearing in the dividend. As 25 is a whole number with two figures (2 and 5) we turn down the decimal pointer to the left of the dividend decimal point two places between the 1 and 3. **See illustration.** This simple method of establishing an accurate decimal position in the answer is found only on the Comptometer.

Drill carefully on the following problems and check your answers with those shown here.

1. $41.778 \div 45 = .9284$

3. $297.364 \div 34 = 8.746$

5. $1307.68 \div 22 = 59.44$

2. $16.7772 \div 44 = .3813$

4. $2377.2 \div 56 = 42.45$

6. $89089 \div 89 = 1001$

If the divisor is a decimal without preceding ciphers the answer pointer is the same as the dividend pointer; but if the divisor has preceding ciphers like .0025 the answer pointer is as many places to the right of the dividend pointer as there are ciphers immediately to the right of the decimal point in the divisor. **See illustration.**

As there are no small 9 figured keys, leave blank any column which contains 9; except where 9 is the right-hand figure of value, then the small 8 key is used.

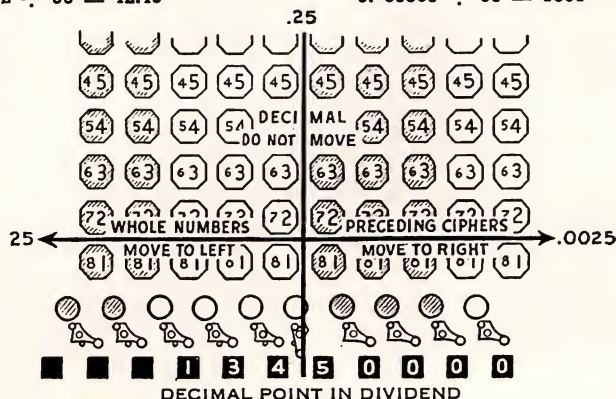


Illustration Showing Direction to Move Decimal Point in Division.

The small cipher keys should be depressed the same as any other figure when they appear between figures of value, as in 704, but should be disregarded if they are at the right of the amount, as in 7500. In the latter case, the divisor 7500 would be held as 75 less one (74).

Long Division

Easy Method for Dividing by Five or More Figures, Using Four-Place Trial Divisor and Obtaining Three Answer Figures at a Time

Example: $4567.89 \div 2436.65 =$

Apply rules for pointing off as indicated in illustration above.

After pointing off, register shows 0'456789.

Divide by first four figures of divisor, using small figures on keys (not taking one less) and don't stop dividing until you get the first three answer figures. After getting the third answer figure, continue to hold with left hand the position of the two left-hand figures of divisor.

Place fingers of right hand on columns immediately to right of the two columns held with left hand, on keys for the remaining unused figures* of divisor, holding according to small figures and one less for the extreme right-hand figure of value of divisor. Leave left hand inactive on keyboard.

Depress keys held by right hand the number of times as indicated by first of the three answer figures already obtained. Then move right hand one position to right and strike as many times as indicated by the second answer figure. Again move right hand one position to right and strike as many times as indicated by the third answer figure already obtained.

The left hand remains inactive on keyboard.

Resume holding first four figures of divisor, with position for first two figures on the columns marked with left hand, and the position for next two figures on columns immediately to the right.

(If remainder, in register under columns held, should be equal to or larger than the divisor, depress complete divisor once more.)

Move finger position one place to right, and divide to get the next three answer figures, exactly the same way as the first three were obtained.

It is not necessary to strike in the remaining figures of divisor the second time, as these figures would not affect a six-place answer.

Divide 0'456789 by 2436 (holding small figures 2436 with two hands) and don't stop dividing until you get the first three answer figures—187. Don't take the fingers of the left hand from keys 24.

Right-hand fingers take positions on small figures 64 (65 less 1) on columns immediately to right of position held with the left hand.

From left to right, strike small figures 64 once, then move to right and strike eight times, then move to right and strike seven times. Register shows 1'87113545.

Fingers of right hand take position on small figures 36. Right and left hand now hold small figures 2436.

Remainder 1135 is not larger than 2436.

Move both hands one position to the right and divide again by 2436 to get three more answer figures.

Register shows 1'87465. Answer 1.87465.

* If it is not convenient to hold all at once with the right hand the remaining unused figures of the divisor, then hold one or two of the remaining figures at a time.

Division Short Cut

In practical every day work, division is used a great deal in the figuring of averages and percentages. For this reason it is unnecessary in many cases to obtain more than three or four decimal places in the answer.

Example:

Sales	\$48,672,392
Profit	2,782,679
Find percent of profit to sales	
\$ 2,782,679	= .0572 or 5.72%
\$48,672,392	

Dividing four figures of the dividend (2782) by four figures of the divisor (4867 **minus** 1) will provide an answer sufficient for practical purposes. A safe rule to follow is to hold **one more figure of the divisor** than figures desired in the answer.

The carrying out of decimals beyond the actual number of places required is a needless waste of time and energy.

Reciprocal Division

The use of reciprocal division in cost, payroll, and statistical work will be very helpful to the operator. The simplicity of this method of division, in addition to its time-saving feature, makes its use very desirable. This method is nothing more than converting division into a multiplication process.

Multiplying any dividend by the reciprocal of its divisor produces the same answer as that obtained by actual division. To obtain the reciprocal of any number, merely divide that number into the figure 1.

Illustration:

Reciprocal of 8 is $1 \div 8$ or .125

Reciprocal of 413 is $1 \div 413$ or .00242130 (See Payroll Example)

Reciprocal of 555 is $1 \div 555$ or .00180180 (See Statistical Example)

Reciprocal of 755 is $1 \div 755$ or .00132450 (See Cost Example)

Reciprocals (See Back Page) of any number from 1 to 2,000 will be found on Reciprocal Card No. 9; and from 1 to 10,000 in Reciprocal Book, form 192.

The easiest way to do reciprocal divisions is to hold the dividend over Permanent Decimal Pointer No. 5, multiplying it from left to right by the recip-

cal of the divisor. Always point off to the left of the Permanent Decimal Point as many places as there are whole numbers in the divisor. The decimal point and preceding ciphers in the reciprocal are entirely disregarded if the problem is worked over the Permanent Decimal Point.

Example of Cost Work:

755 pieces cost \$66.06. What is the average cost per piece? Answer, \$.0875.
 $\$66.06 \div 755$ is the same as $\$66.06 \times .0013245$ (reciprocal of 755).

Hold the dividend \$66.06 over Permanent Decimal Pointer No. 5 and multiply it by the reciprocal of 755. From left to right strike in the dividend one, three, two, four, and five times respectively. As the

divisor (755) contains three whole numbers, it requires pointing off to the left of Permanent Decimal Pointer No. 5 three places. The answer dial now shows \$.0875.

Example of Payroll Work:

\$35.00 earned in 41.3 hours. What is the average hourly rate? Answer, \$.847.
 $\$35.00 \div 41.3$ is the same as $\$35.00 \times .024213$ (reciprocal of 413).

Hold the dividend \$35.00 to left of Permanent Decimal Pointer No. 5 and multiply it by the reciprocal of 413. From left to right strike in the dividend two, four, two, one, and three times respectively.

As the divisor (41.3) contains two whole numbers, it requires pointing off to the left of Permanent Decimal Pointer No. 5 two places. The answer dial now shows \$.847.

Example of Statistical Work:

Department A Sales	\$104.56 =	.1884 or 18.84 %
Department B Sales	75.54 =	.1361 or 13.61 %
Department C Sales	344.21 =	.6202 or 62.02 %
Department D Sales	22.14 =	.0399 or 3.99 %
Department E Sales	8.55 =	.0154 or 1.54 %
	<u>\$555.00</u>	<u>1.0000</u> <u>100.00 %</u>

It is desired to know what percent of the total sales is represented by each department. This requires dividing each of the amounts by the total, or \$555.00.

As 555 contains three whole numbers, it requires pointing off three places to the left of Permanent Decimal Pointer No. 5. Hold the first dividend, \$104.56, to the left of Permanent Decimal Pointer No. 5, and multiply it by the reciprocal of 555. From left to right strike in the dividend one, eight, zero, one, and eight times respectively. The answer dial shows .1884 or 18.84%. In the same manner hold the other departments and multiply by the same reciprocal. To prove accuracy of the work add the results

obtained; these should total 1 or 100%, as the case may be.

In the ordinary division problems found in cost, payroll, and statistical work a four-figure answer is usually sufficient. In order to obtain four-figure accuracy it will be necessary to use six figures of the reciprocal. A safe rule to follow is to use two more figures of the reciprocal than desired figure places in the answer—that is, if a four-place answer is desired use six of the reciprocal figures, if a five-place answer is desired use seven figures of the reciprocal.

With a little practice and the use of Reciprocal Card No. 9, the operator will develop speed on this simple method of division.

	100	200	300	400	500	600	700	800	900
1	1000.000	101.90099	103.93333	105.95000	107.96000	109.96667	111.96875	113.96875	115.96875
2	500.000	50.98039	51.95050	52.93126	53.92187	54.92222	55.92222	56.92222	57.92222
3	333.333	33.97074	34.92611	35.90033	36.89303	37.90383	38.91463	39.92543	40.93623
4	250.000	25.96158	26.91905	27.89667	28.89333	29.90000	30.90667	31.91333	32.92000
5	200.000	20.95238	21.91667	22.89333	23.89333	24.90000	25.90667	26.91333	27.92000
6	166.667	16.94306	17.91667	18.89333	19.89333	20.90000	21.90667	22.91333	23.92000
7	142.857	14.93479	15.91667	16.89333	17.89333	18.90000	19.90667	20.91333	21.92000
8	125.000	12.92592	13.91667	14.89333	15.89333	16.90000	17.90667	18.91333	19.92000
9	111.111	11.91741	12.91667	13.89333	14.89333	15.90000	16.90667	17.91333	18.92000
10	100.000	10.90909	11.91667	12.91667	13.91667	14.91667	15.91667	16.91667	17.91667
11	90.90909	10.10909	11.10909	12.10909	13.10909	14.10909	15.10909	16.10909	17.10909
12	83.33333	9.33333	10.33333	11.33333	12.33333	13.33333	14.33333	15.33333	16.33333
13	76.92308	8.69565	9.69565	10.69565	11.69565	12.69565	13.69565	14.69565	15.69565
14	71.42857	8.17143	9.17143	10.17143	11.17143	12.17143	13.17143	14.17143	15.17143
15	66.66667	7.65556	8.65556	9.65556	10.65556	11.65556	12.65556	13.65556	14.65556
16	62.50000	7.25000	8.25000	9.25000	10.25000	11.25000	12.25000	13.25000	14.25000
17	58.82353	6.84710	7.84710	8.84710	9.84710	10.84710	11.84710	12.84710	13.84710
18	55.55556	6.47558	7.47558	8.47558	9.47558	10.47558	11.47558	12.47558	13.47558
19	52.63158	6.10333	7.10333	8.10333	9.10333	10.10333	11.10333	12.10333	13.10333
20	50.00000	5.00000	6.00000	7.00000	8.00000	9.00000	10.00000	11.00000	12.00000
21	47.61905	4.76190	5.76190	6.76190	7.76190	8.76190	9.76190	10.76190	11.76190
22	45.45455	4.54545	5.54545	6.54545	7.54545	8.54545	9.54545	10.54545	11.54545
23	43.47826	4.34783	5.34783	6.34783	7.34783	8.34783	9.34783	10.34783	11.34783
24	41.66667	4.16667	5.16667	6.16667	7.16667	8.16667	9.16667	10.16667	11.16667
25	40.00000	4.00000	5.00000	6.00000	7.00000	8.00000	9.00000	10.00000	11.00000
26	38.46154	3.84615	4.84615	5.84615	6.84615	7.84615	8.84615	9.84615	10.84615
27	37.03704	3.70370	4.70370	5.70370	6.70370	7.70370	8.70370	9.70370	10.70370
28	35.71429	3.57143	4.57143	5.57143	6.57143	7.57143	8.57143	9.57143	10.57143
29	34.48276	3.44828	4.44828	5.44828	6.44828	7.44828	8.44828	9.44828	10.44828
30	33.33333	3.33333	4.33333	5.33333	6.33333	7.33333	8.33333	9.33333	10.33333
31	32.25806	3.22581	4.22581	5.22581	6.22581	7.22581	8.22581	9.22581	10.22581
32	31.25000	3.12500	4.12500	5.12500	6.12500	7.12500	8.12500	9.12500	10.12500
33	30.30303	3.03030	4.03030	5.03030	6.03030	7.03030	8.03030	9.03030	10.03030
34	29.11111	2.91111	3.91111	4.91111	5.91111	6.91111	7.91111	8.91111	9.91111
35	28.57143	2.85714	3.85714	4.85714	5.85714	6.85714	7.85714	8.85714	9.85714
36	27.77778	2.77778	3.77778	4.77778	5.77778	6.77778	7.77778	8.77778	9.77778
37	27.02703	2.70270	3.70270	4.70270	5.70270	6.70270	7.70270	8.70270	9.70270
38	26.31579	2.63158	3.63158	4.63158	5.63158	6.63158	7.63158	8.63158	9.63158
39	25.64103	2.56410	3.56410	4.56410	5.56410	6.56410	7.56410	8.56410	9.56410
40	25.00000	2.50000	3.50000	4.50000	5.50000	6.50000	7.50000	8.50000	9.50000
41	24.39024	2.43902	3.43902	4.43902	5.43902	6.43902	7.43902	8.43902	9.43902
42	23.80952	2.38095	3.38095	4.38095	5.38095	6.38095	7.38095	8.38095	9.38095
43	23.25581	2.32558	3.32558	4.32558	5.32558	6.32558	7.32558	8.32558	9.32558
44	22.72727	2.27273	3.27273	4.27273	5.27273	6.27273	7.27273	8.27273	9.27273
45	22.22222	2.22222	3.22222	4.22222	5.22222	6.22222	7.22222	8.22222	9.22222
46	21.73913	2.17391	3.17391	4.17391	5.17391	6.17391	7.17391	8.17391	9.17391
47	21.27660	2.12767	3.12767	4.12767	5.12767	6.12767	7.12767	8.12767	9.12767
48	20.83333	2.08333	3.08333	4.08333	5.08333	6.08333	7.08333	8.08333	9.08333
49	20.40816	2.04082	3.04082	4.04082	5.04082	6.04082	7.04082	8.04082	9.04082
50	20.00000	2.00000	3.00000	4.00000	5.00000	6.00000	7.00000	8.00000	9.00000
51	19.60784	1.96078	2.96078	3.96078	4.96078	5.96078	6.96078	7.96078	8.96078
52	19.23080	1.92308	2.92308	3.92308	4.92308	5.92308	6.92308	7.92308	8.92308
53	18.87778	1.88778	2.88778	3.88778	4.88778	5.88778	6.88778	7.88778	8.88778
54	18.54185	1.85419	2.85419	3.85419	4.85419	5.85419	6.85419	7.85419	8.85419
55	18.18182	1.81818	2.81818	3.81818	4.81818	5.81818	6.81818	7.81818	8.81818
56	17.85714	1.78571	2.78571	3.78571	4.78571	5.78571	6.78571	7.78571	8.78571
57	17.54386	1.75439	2.75439	3.75439	4.75439	5.75439	6.75439	7.75439	8.75439
58	17.24143	1.72414	2.72414	3.72414	4.72414	5.72414	6.72414	7.72414	8.72414
59	16.94922	1.69492	2.69492	3.69492	4.69492	5.69492	6.69492	7.69492	8.69492
60	16.66667	1.66667	2.66667	3.66667	4.66667	5.66667	6.66667	7.66667	8.66667
61	16.39344	1.63934	2.63934	3.63934	4.63934	5.63934	6.63934	7.63934	8.63934
62	16.12903	1.61290	2.61290	3.61290	4.61290	5.61290	6.61290	7.61290	8.61290
63	15.87302	1.58730	2.58730	3.58730	4.58730	5.58730	6.58730	7.58730	8.58730
64	15.62500	1.56250	2.56250	3.56250	4.56250	5.56250	6.56250	7.56250	8.56250
65	15.38462	1.53846	2.53846	3.53846	4.53846	5.53846	6.53846	7.53846	8.53846
66	15.15152	1.51515	2.51515	3.51515	4.51515	5.51515	6.51515	7.51515	8.51515
67	14.92537	1.49254	2.49254	3.49254	4.49254	5.49254	6.49254	7.49254	8.49254
68	14.70588	1.47059	2.47059	3.47059	4.47059	5.47059	6.47059	7.47059	8.47059
69	14.49276	1.44928	2.44928	3.44928	4.44928	5.44928	6.44928	7.44928	8.44928
70	14.28571	1.42857	2.42857	3.42857	4.42857	5.42857	6.42857	7.42857	8.42857
71	14.08450	1.40845	2.40845	3.40845	4.40845	5.40845	6.40845	7.40845	8.40845
72	13.88889	1.38889	2.38889	3.38889	4.38889	5.38889	6.38889	7.38889	8.38889
73	13.69808	1.36981	2.36981	3.36981	4.36981	5.36981	6.36981	7.36981	8.36981
74	13.51351	1.35135	2.35135	3.35135	4.35135	5.35135	6.35135	7.35135	8.35135
75	13.33333	1.33333	2.33333	3.33333	4.33333	5.33333	6.33333	7.33333	8.33333
76	13.15789	1.31579	2.31579	3.31579	4.31579	5.31579	6.31579	7.31579	8.31579
77	12.98701	1.29870	2.29870	3.29870	4.29870	5.29870	6.29870	7.29870	8.29870
78	12.82051	1.28205	2.28205	3.28205	4.28205	5.28205	6.28205	7.28205	8.28205
79	12.65829	1.26583	2.26583	3.26583	4.26583	5.26583	6.26583	7.26583	8.26583
80	12.50000	1.25000	2.25000	3.25000	4.25000	5.25000	6.25000	7.25000	8.25000
81	12.34671	1.23467	2.23467	3.23467	4.23467	5.23467	6.23467	7.23467	8.23467
82	12.19512	1.21951	2.21951	3.21951	4.21951	5.21951	6.21951	7.21951	8.21951
83	12.04482	1.20448	2.20448	3.20448	4.20448	5.20448	6.20448	7.20448	8.20448
84	11.89448	1.18944	2.18944	3.18944	4.18944	5.18944	6.18944	7.18944	8.18944
85	11.74471	1.17447	2.17447	3.17447	4.17447	5.17447	6.17447	7.17447	8.17447
86	11.59492	1.15949	2.15949	3.15949	4.15949	5.15949	6.15949	7.15949	8.15949
87	11.44479	1.14448	2.14448	3.14448	4.14448	5.14448	6.14448	7.14448	8.14448
88	11.29448	1.12944	2.12944	3.12944	4.12944	5.12944	6.12944	7.12944	8.12944
89	11.14448	1.11448	2.11448	3.11448	4.11448	5.11448	6.11448	7.11448	8.11448
90	11.00000	1.10000	2.10000	3.10000	4.10000	5.10000	6.10000	7.10000	8.10000
91	10.85455	1.08545	2.08545	3.08545	4.08545	5.08545	6.08545	7.08545	8.08545
92	10.70968	1.07097	2.07097	3.07097	4.07097	5.07097	6.07097	7.07097	8.07097
93	10.56492	1.05649	2.05649	3.05649	4.05649	5.05649	6.05649	7.05649	8.05649
94	10.42037	1.04204	2.04204	3.04204	4.04204	5.04204	6.04204	7.04204	8.04204
95	10.27593	1.02759	2.02759	3.02759	4.02759	5.02759	6.02759	7.02759	8.02759
96	10.13158	1.01316	2.01316	3.01316	4.01316	5.01316	6.01316	7.01316	8.01316
97	10.00000	1.00000	2.00000	3.00000	4.00000	5.00000	6.00000	7.00000	8.00000
98	9.85455	0.98545	1.98545	2.98545	3.98545	4.98545	5.98545	6.98545	7.98545
99	9.70968	0.97097	1.97097	2.97097	3.97097	4.97097	5.97097	6.9709	

COMPTONER RECIPROCAL TABLE-Continued

1001 to 2000

	1100	1200	1300	1400	1500	1600	1700	1800	1900
1001	99900	1100	90000	1200	83333	1300	76667	1400	71429
1002	99800	1102	90444	1202	83195	1302	76805	1402	71327
1003	99700	1103	90662	1203	83126	1303	76746	1403	71276
1004	99602	1104	90580	1204	83066	1304	76687	1404	71225
1005	99502	1105	90498	1205	82988	1305	76628	1405	71174
1006	99404	1106	90416	1206	82919	1306	76570	1406	71124
1007	99305	1107	90331	1207	82850	1307	76512	1407	71073
1008	99206	1108	90246	1208	82781	1308	76453	1408	71023
1009	99108	1109	90171	1209	82713	1309	76394	1409	70972
1010	99010	1110	90090	1210	82645	1310	76336	1410	70923
1011	98912	1111	90009	1211	82578	1311	76278	1411	70872
1012	98814	1112	89928	1212	82508	1312	76220	1412	70822
1013	98717	1113	89847	1213	82440	1313	76161	1413	70771
1014	98619	1114	89767	1214	82372	1314	76104	1414	70721
1015	98522	1115	89686	1215	82305	1315	76046	1415	70671
1016	98425	1116	89606	1216	82237	1316	75988	1416	70621
1017	98328	1117	89526	1217	82169	1317	75930	1417	70572
1018	98232	1118	89445	1218	82102	1318	75873	1418	70522
1019	98135	1119	89366	1219	82034	1319	75815	1419	70473
1020	98039	1120	89286	1220	81967	1320	75758	1420	70423
1021	97943	1121	89206	1221	81900	1321	75700	1421	70373
1022	97847	1122	89127	1222	81833	1322	75643	1422	70323
1023	97752	1123	89047	1223	81766	1323	75586	1423	70274
1024	97656	1124	88968	1224	81699	1324	75529	1424	70225
1025	97561	1125	88889	1225	81633	1325	75472	1425	70175
1026	97466	1126	88808	1226	81566	1326	75416	1426	70126
1027	97371	1127	88727	1227	81500	1327	75359	1427	70077
1028	97276	1128	88647	1228	81433	1328	75303	1428	70028
1029	97182	1129	88567	1229	81367	1329	75246	1429	69979
1030	97087	1130	88486	1230	81301	1330	75189	1430	69930
1031	96993	1131	88417	1231	81235	1331	75131	1431	69881
1032	96899	1132	88339	1232	81169	1332	75074	1432	69832
1033	96805	1133	88261	1233	81103	1333	75017	1433	69783
1034	96712	1134	88183	1234	81037	1334	74960	1434	69734
1035	96618	1135	88106	1235	80972	1335	74903	1435	69685
1036	96525	1136	88028	1236	80906	1336	74846	1436	69636
1037	96432	1137	87951	1237	80841	1337	74789	1437	69587
1038	96339	1138	87873	1238	80775	1338	74732	1438	69538
1039	96246	1139	87796	1239	80710	1339	74675	1439	69489
1040	96153	1140	87719	1240	80645	1340	74618	1440	69440
1041	96060	1141	87642	1241	80580	1341	74561	1441	69391
1042	95967	1142	87565	1242	80515	1342	74504	1442	69342
1043	95874	1143	87488	1243	80450	1343	74447	1443	69293
1044	95781	1144	87411	1244	80385	1344	74390	1444	69244
1045	95688	1145	87334	1245	80320	1345	74333	1445	69195
1046	95595	1146	87257	1246	80255	1346	74276	1446	69146
1047	95502	1147	87180	1247	80190	1347	74219	1447	69097
1048	95409	1148	87103	1248	80125	1348	74162	1448	69048
1049	95316	1149	87026	1249	80060	1349	74105	1449	69000
1050	95223	1150	86949	1250	80000	1350	74048	1450	68951
1051	95130	1151	86872	1251	79935	1351	73991	1451	68902
1052	95037	1152	86795	1252	79870	1352	73934	1452	68853
1053	94944	1153	86718	1253	79805	1353	73877	1453	68804
1054	94851	1154	86641	1254	79740	1354	73820	1454	68755
1055	94758	1155	86564	1255	79675	1355	73763	1455	68706
1056	94665	1156	86487	1256	79610	1356	73706	1456	68657
1057	94572	1157	86410	1257	79545	1357	73649	1457	68608
1058	94479	1158	86333	1258	79480	1358	73592	1458	68559
1059	94386	1159	86256	1259	79415	1359	73535	1459	68510
1060	94293	1160	86179	1260	79350	1360	73478	1460	68461
1061	94200	1161	86102	1261	79285	1361	73421	1461	68412
1062	94107	1162	86025	1262	79220	1362	73364	1462	68363
1063	94014	1163	85948	1263	79155	1363	73307	1463	68314
1064	93921	1164	85871	1264	79090	1364	73250	1464	68265
1065	93828	1165	85794	1265	79025	1365	73193	1465	68216
1066	93735	1166	85717	1266	78960	1366	73136	1466	68167
1067	93642	1167	85640	1267	78895	1367	73079	1467	68118
1068	93549	1168	85563	1268	78830	1368	73022	1468	68069
1069	93456	1169	85486	1269	78765	1369	72965	1469	68020
1070	93363	1170	85409	1270	78700	1370	72908	1470	67971
1071	93270	1171	85332	1271	78635	1371	72851	1471	67922
1072	93177	1172	85255	1272	78570	1372	72794	1472	67873
1073	93084	1173	85178	1273	78505	1373	72737	1473	67824
1074	92991	1174	85101	1274	78440	1374	72680	1474	67775
1075	92898	1175	85024	1275	78375	1375	72623	1475	67726
1076	92805	1176	84947	1276	78310	1376	72566	1476	67677
1077	92712	1177	84870	1277	78245	1377	72509	1477	67628
1078	92619	1178	84793	1278	78180	1378	72452	1478	67579
1079	92526	1179	84716	1279	78115	1379	72395	1479	67530
1080	92433	1180	84639	1280	78050	1380	72338	1480	67481
1081	92340	1181	84562	1281	77985	1381	72281	1481	67432
1082	92247	1182	84485	1282	77920	1382	72224	1482	67383
1083	92154	1183	84408	1283	77855	1383	72167	1483	67334
1084	92061	1184	84331	1284	77790	1384	72110	1484	67285
1085	91968	1185	84254	1285	77725	1385	72053	1485	67236
1086	91875	1186	84177	1286	77660	1386	71996	1486	67187
1087	91782	1187	84100	1287	77595	1387	71939	1487	67138
1088	91689	1188	84023	1288	77530	1388	71882	1488	67089
1089	91596	1189	83946	1289	77465	1389	71825	1489	67040
1090	91503	1190	83869	1290	77400	1390	71768	1490	66991
1091	91410	1191	83792	1291	77335	1391	71711	1491	66942
1092	91317	1192	83715	1292	77270	1392	71654	1492	66893
1093	91224	1193	83638	1293	77205	1393	71597	1493	66844
1094	91131	1194	83561	1294	77140	1394	71540	1494	66795
1095	91038	1195	83484	1295	77075	1395	71483	1495	66746
1096	90945	1196	83407	1296	77010	1396	71426	1496	66697
1097	90852	1197	83330	1297	76945	1397	71369	1497	66648
1098	90759	1198	83253	1298	76880	1398	71312	1498	66599
1099	90666	1199	83176	1299	76815	1399	71255	1499	66550
1100	90573	1200	83099	1300	76750	1400	71198	1500	66501
1101	90480	1201	83022	1301	76685	1401	71141	1501	66452
1102	90387	1202	82945	1302	76620	1402	71084	1502	66403
1103	90294	1203	82868	1303	76555	1403	71027	1503	66354
1104	90201	1204	82791	1304	76490	1404	70970	1504	66305
1105	90108	1205	82714	1305	76425	1405	70913	1505	66256
1106	90015	1206	82637	1306	76360	1406	70856	1506	66207
1107	89922	1207	82560	1307	76295	1407	70799	1507	66158
1108	89829	1208	82483	1308	76230	1408	70742	1508	66109
1109	89736	1209	82406	1309	76165	1409	70685	1509	66060
1110	89643	1210	82329	1310	76100	1410	70628	1510	66011
1111	89550	1211	82252	1311	76035	1411	70571	1511	65962
1112	89457	1212	82175	1312	75970	1412	70514	1512	65913
1113	89364	1213	82098	1313	75905	1413	70457	1513	65864
1114	89271	1214	82021	1314	75840	1414	70400	1514	65815
1115	89178	1215	81944	1315	75775	1415	70343	1515	65766
1116	89085	1216	81867	1316	75710	1416	70286	1516	65717
1117	88992	1217	81790	1317	75645	1417	70229	1517	65668
1118	88899	1218	81713	1318	75580	1418	70172	1518	65619
1119	88806	1219	81636	1319	75515	1419	70115	1519	65570
1120	88713	1220	81559	1320	75450	1420	70058	1520	65521
1121	88620	1221	81482	1321					

